(General Radio)

STACO

INSTALLATION - OPERATING INSTRUCTIONS

POWERSTAT VARIABLE TRANSFORMERS

ALL MODELS

TYPES 116 - 216

INSPECTION

Your new POWERSTAT variable transformer is built of the highest grade materials and is constructed with the greatest care but excessive rough handling during shipment may cause damage. When unpacking your POWERSTAT, examine the unit carefully to determine whether injury has resulted to any of the component parts. Examine the brush contact with particular care. Also, make sure that the mounting template (all types) and the dial and knob together with the dial mounting screws for types 116U, 116UI, 116U-2S, 116U-2D, 116U-3Y, 216U, 216UI, 216U-2S, 216U-2D, and 216U-3Y are in the shipping carton. The "Damage and Shortage" instruction packed with the unit outlines the proper procedure to follow if any parts are damaged or missing.

INSTALLATION

SINGLE UNITS

POWERSTAT variable transformer types 116, 3PF116, 3PN116, 3TF116, 216, 3PF216, 3PN216 and 3TF216 are designed for bench or wall mounting. Mounting is extremely simple. By using the drilling template supplied with these instructions, the three mounting holes are readily located. After locating the hole centers, the mounting holes are drilled to accommodate ¼ inch diameter mounting screws. The POWERSTAT is then mounted by placing the POWERSTAT in position and tightening the mounting screws. The same procedure is followed for mounting types 116UI and 216UI which are similar to types 116 and 216; respectively, except they have no screen, terminal enclosure, input cord-plug, out-put receptacle, "on-off" switch or fuse.

Types 116U and 216U are uncased units with the driving shaft extended from the base end for back-of-panel mounting. They are supplied without the protective screening, enclosed terminal box, input cord-plug, output receptacle, "on-off" switch and fuse. Mounting the 116U and 216U models is more difficult than mounting the cased units. To have the terminal board with the connection lugs facing upward in the most convenient wiring position the mounting template should be placed against the panel so that the indicating arrow marked "top" on the template faces upward. With the mounting template in place the three POWERSTAT base mounting holes, the three dial holes, and the shaft hole can be located. After drilling the size holes as noted on the template, the POWERSTAT and indicating dial are secured in place. The knob is then placed on the shaft and the pointer adjusted to the correct position with respect to the knob and brush contact location. Since the indicating dial can be used only when clockwise rotation is desired for increasing voltage, do not drill the dial mounting holes if counter-clockwise rotation for increasing voltage is necessary.

GANGED ASSEMBLIES

POWERSTAT types 116-2S and 216-2S are two gang assemblies for series connected single phase operation. Types 116-2D and 216-2D are two gang assemblies for open delta connected three phase operation. Types 116-3Y and 216-3Y are three gang assemblies for wye connected three phase operation. They are supplied with screening but do not have an input cord-plug, output receptacle, "on-off" switch or fuse. A readily removable terminal enclosure protects the terminal board and connection lugs. The dial and knob are located at the commutator end of the assembly for bench mounting. The mounting procedure is identical to the method outlined for POWERSTAT types 116 and 216.

When the above mentioned ganged assemblies are to be panel mounted, the uncased units with the shaft extending from the base end are supplied. These models are cataloged as types 116U-2S, 116U-2D, 116U-3Y, 216U-2S, 216U-2D, and 216U-3Y. The mounting procedure as outlined for types 116U and 216U is to be followed except an additional support (cradle) is recommended. This is a necessary precaution to prevent any possible sagging of the ganged assembly.

CONNECTIONS AND RATINGS

SINGLE UNITS

TYPES 116 and 216

These units are fused and are provided with line switches, enclosed terminal boxes and 2-wire parallel-blade input cord-plug sets and output receptacles. Since POWERSTAT variable transformers are autotransformers, one side of the input line and one side of the output line are common. For polarity identification (when required) the connection that is common to the input and output is the nickel plated blade of the input plug, the lower side of the line switch inside the terminal box and the wider slot of the output receptacle. Type 116 is fused for 8 amperes, Type 216 for 3 amperes. Ratings are shown in Chart No. 1.

Sometimes it is desired to operate a POWERSTAT Type 116 or 216 so the maximum output voltage is limited to the input voltage, ("L" connection) to reverse the knob rotation or, with Type 216, to operate it from a 120-volt line with an output voltage range of 0-280 volts. Directions for making these changes are given on the tag enclosed with the unit and also in Chart No. 1. When a type 216 is operated from a 120 volt line, the output current at any particular output voltage must not exceed the amount indicated in Figure 1.

TYPES 3PF116, 3PN116, 3TF116, 3PF216, 3PN216 and 3TF216

Certain applications require that POWERSTATS be supplied with three wire cords, plugs and receptacles with the third wire grounded to the POWERSTAT frame. Types 3PF116, 3PN116, 3TF116, 3PF216, 3PN216 and 3TF216 offer this feature. They have the same ratings as types 116 and 216. The 3PF types have "Crow-Foot" blade arrangement, the 3PN types are NEMA type, and the 3TF are twist-lock. Ratings are shown in Chart No. 1.

Unlike Types 116 and 216, these units cannot be converted for limited output voltage range or reversed knob rotation. Units to operate under these conditions must be so ordered from the factory. Types 3PF216 and 3TF216 may be ordered to operate from a 120 volt line, subject to the output current limitations indicated in Figure 1. Type 3PN216 is for a 240 volt supply only.

LIMITED OUTPUT VOLTAGE TYPES

POWERSTATS Types 116 and 216 may be converted if desired so the maximum output voltage does not exceed the line voltage. They may be ordered connected this way at the factory if desired. Types 3PF, 3PN and 3TF cannot be converted in the field and must be so connected when ordered. When units are ordered connected this way, an "L" is inserted in the type number, making them Types 116L, 3PF116L, 3PN116L, 3TF116L, 216L, 3PF216L, 3PN216L, and 3TF216L. Chart No. 1 shows their ratings.

TYPES 116U, 116UI, 216U and 216UI

These units have the same electrical ratings as types 116 and 216 but have no fuses, line switches, terminal enclosures, input cords or output receptacles. Connections are made to an open terminal board. Types 116U and 216U are for back-of-panel mounting; types 116UI and 216UI are for bench mounting. Ratings and connections are shown in Chart No. 1 and Figure 2.

CHART No. 1

Single Phase Connection

Type	Mounting Style	Input Volts	Frequency	Output Volts	Max. Output Amps.	Max. KVA	Rotation	Input Terms	Output Terms
116L or 116	Bench	120	50/60	0-140	7.5	1.0	CW	1-2	1-3
		120	50/60	0-140	7.5	1.0	CCW	4-5	3-4
		120	50/60	0-120	7.5	.90	CW	1-4	1-3
		120	50/60	0-120	7.5	.90	CCW	1-4	3-4
3PF116	Bench	120	50/60	0-140	7.5	1.0	CW	6-7	3-6
3PN116	Bench	120	50/60	0-140	7.5	1.0	CW	6-7	3-6
3TF116	Bench	120	50/60	0-140	7.5	1.0	CW	6-7	3-6
3PF116L	Bench	120	50/60	0-120	7.5	.90	CW	6-7	3-6
3PN116L	Bench	120	50/60	0-120	7.5	.90	CW	6-7	3-6
3TF116L	Bench	120	50/60	0-120	7.5	.90	CW	6-7	3-6
216L or 216	Bench	240	50/60	0-280	3.0	.84	CW	1-2	1-3
		240	50/60	0-280	3.0	.84	CCW	4-5	3-4
		240	50/60	0-240	3.0	.72	CW	1-4	1-3
		240	50/60	0-240	3.0	.72	CCW	1-4	3-4
		120	50/60	0-280	Fig. 1	.....	CW	1-6	1-3
		120	50/60	0-280	Fig. 1	.....	CCW	4-7	3-4
3PF216	Bench	240	50/60	0-280	3.0	.84	CW	6-7	3-6
3PN216	Bench	240	50/60	0-280	3.0	.84	CW	6-7	3-6
3TF216	Bench	240	50/60	0-280	3.0	.84	CW	6-7	3-6
3PF216L	Bench	240	50/60	0-240	3.0	.72	CW	6-7	3-6
3PN216L	Bench	240	50/60	0-240	3.0	.72	CW	6-7	3-6
3TF216L	Bench	240	50/60	0-240	3.0	.72	CW	6-7	3-6
116U	Panel	120	50/60	0-140	7.5	1.0	CW	4-5	3-4
		120	50/60	0-140	7.5	1.0	CCW	1-2	1-3
		120	50/60	0-120	7.5	.90	CW	1-4	3-4
		120	50/60	0-120	7.5	.90	CCW	1-4	1-3
116UI	Bench	120	50/60	0-140	7.5	1.0	CW	1-2	1-3
		120	50/60	0-140	7.5	1.0	CCW	4-5	3-4
		120	50/60	0-120	7.5	.90	CW	1-4	1-3
		120	50/60	0-120	7.5	.90	CCW	1-4	3-4
216U	Panel	240	50/60	0-280	3.0	.84	CW	4-5	3-4
		240	50/60	0-280	3.0	.84	CCW	1-2	1-3
		240	50/60	0-240	3.0	.72	CW	1-4	3-4
		240	50/60	0-240	3.0	.72	CCW	1-4	1-3
		120	50/60	0-280	Fig. 1	.....	CW	4-7	3-4
		120	50/60	0-280	Fig. 1	.....	CCW	1-6	1-3
216UI	Bench	240	50/60	0-280	3.0	.84	CW	1-2	1-3
		240	50/60	0-280	3.0	.84	CCW	4-5	3-4
		240	50/60	0-240	3.0	.72	CW	1-4	1-3
		240	50/60	0-240	3.0	.72	CCW	1-4	3-4
		120	50/60	0-280	Fig. 1	.....	CW	1-6	1-3
		120	50/60	0-280	Fig. 1	.....	CCW	4-7	3-4

FIGURE 1

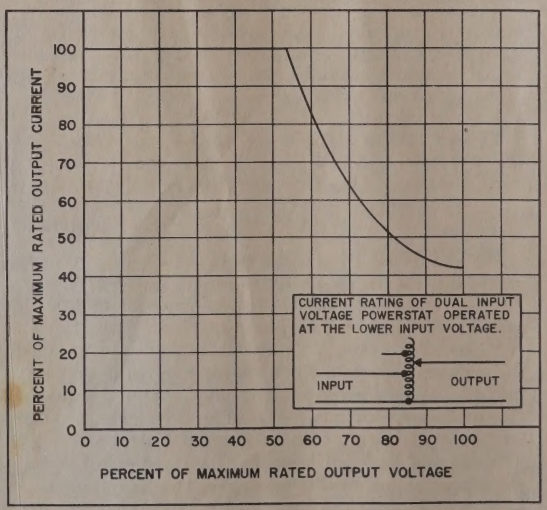
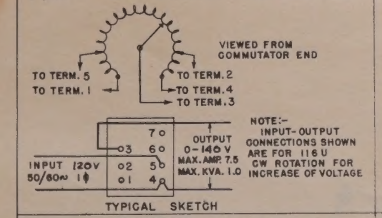


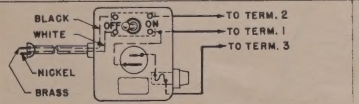
FIG. 1

COIL-TERMINAL BOARD CONNECTIONS FOR TYPES 116, 116U & 116UI POWERSTATS



TYPICAL SKETCH

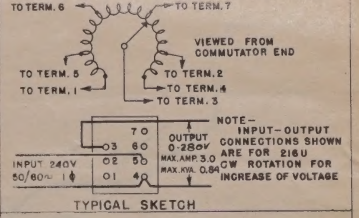
FIG. 2



TERMINAL BOX CONNECTIONS (FRONT VIEW) FOR TYPE 116 POWERSTAT

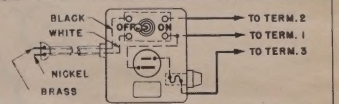
FIG. 3

COIL-TERMINAL BOARD CONNECTIONS FOR TYPES 216, 216U & 216UI POWERSTATS



TYPICAL SKETCH

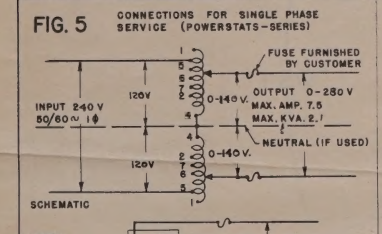
FIG. 4



TERMINAL BOX CONNECTIONS (FRONT VIEW) FOR TYPE 216 POWERSTAT

FIG. 5

CONNECTIONS FOR SINGLE PHASE SERVICE (POWERSTATS-SERIES)



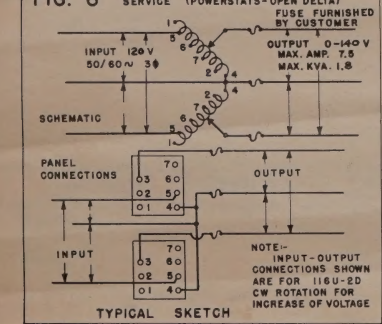
TYPICAL SKETCH

NOTES:-

1. FOR DIRECTION OF ROTATION FOR VOLTAGE INCREASE ALWAYS VIEW FROM KNOB END OF POWERSTAT.
2. JUMPER LOCATION MUST CORRESPOND TO LOCATION SPECIFIED IN COLUMN HEADED "JUMPER TERMS".
3. GANGED UNITS AS SUPPLIED BY FACTORY ARE JUMPERED FOR CW ROTATION.

FIG. 6

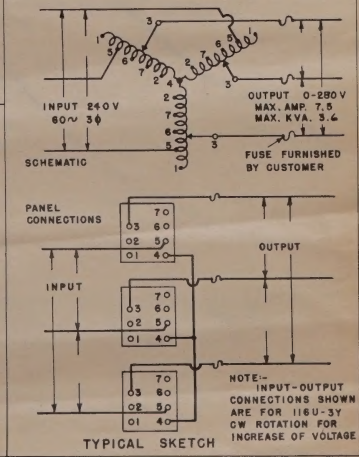
CONNECTIONS FOR THREE PHASE SERVICE (POWERSTATS-OPEN DELTA)



TYPICAL SKETCH

FIG. 7

CONNECTIONS FOR THREE PHASE SERVICE (POWERSTATS-WYE)



TYPICAL SKETCH

FIG. 8

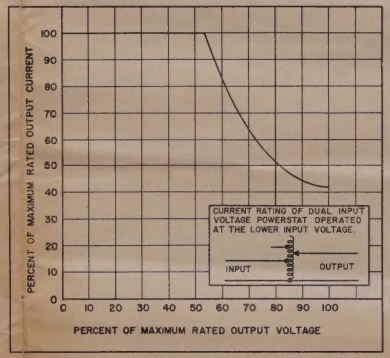


CHART No. 1

Single Phase Connection

Type	Mounting Style	Input Volts	Frequency	Output Volts	Max. Output Amps.	Max. KVA	Rotation	Input Terms	Output Terms
116L or 116	Bench	120	50/60	0-140	7.5	1.0	CW	1-2	1-3
		120	50/60	0-140	7.5	1.0	CCW	4-5	3-4
		120	50/60	0-120	7.5	.90	CW	1-4	1-3
		120	50/60	0-120	7.5	.90	CCW	1-4	3-4
3PF116	Bench	120	50/60	0-140	7.5	1.0	CW	6-7	3-6
3PN116	Bench	120	50/60	0-140	7.5	1.0	CW	6-7	3-6
3TF116	Bench	120	50/60	0-140	7.5	1.0	CW	6-7	3-6
3PF116L	Bench	120	50/60	0-120	7.5	.90	CW	6-7	3-6
3PN116L	Bench	120	50/60	0-120	7.5	.90	CW	6-7	3-6
3TF116L	Bench	120	50/60	0-120	7.5	.90	CW	6-7	3-6
216L or 216	Bench	240	50/60	0-280	3.0	.84	CW	1-2	1-3
		240	50/60	0-280	3.0	.84	CCW	4-5	3-4
		240	50/60	0-240	3.0	.72	CW	1-4	1-3
		240	50/60	0-240	3.0	.72	CCW	1-4	3-4
		120	50/60	0-280	Fig. 8	....	CW	1-6	1-3
		120	50/60	0-280	Fig. 8	....	CCW	4-7	3-4
3PF216	Bench	240	50/60	0-280	3.0	.84	CW	6-7	3-6
3PN216	Bench	240	50/60	0-280	3.0	.84	CW	6-7	3-6
3TF216	Bench	240	50/60	0-280	3.0	.84	CW	6-7	3-6
3PF216L	Bench	240	50/60	0-240	3.0	.72	CW	6-7	3-6
3PN216L	Bench	240	50/60	0-240	3.0	.72	CW	6-7	3-6
3TF216L	Bench	240	50/60	0-240	3.0	.72	CW	6-7	3-6
116U	Panel	120	50/60	0-140	7.5	1.0	CW	4-5	3-4
		120	50/60	0-140	7.5	1.0	CCW	1-2	1-3
		120	50/60	0-120	7.5	.90	CW	1-4	3-4
		120	50/60	0-120	7.5	.90	CCW	1-4	1-3
116UI	Bench	120	50/60	0-140	7.5	1.0	CW	1-2	1-3
		120	50/60	0-140	7.5	1.0	CCW	4-5	3-4
		120	50/60	0-120	7.5	.90	CW	1-4	1-3
		120	50/60	0-120	7.5	.90	CCW	1-4	3-4
216U	Panel	240	50/60	0-280	3.0	.84	CW	4-5	3-4
		240	50/60	0-280	3.0	.84	CCW	1-2	1-3
		240	50/60	0-240	3.0	.72	CW	1-4	3-4
		240	50/60	0-240	3.0	.72	CCW	1-4	1-3
		120	50/60	0-280	Fig. 8	....	CW	1-6	3-4
		120	50/60	0-280	Fig. 8	....	CCW	1-6	1-3
216UI	Bench	240	50/60	0-280	3.0	.84	CW	1-2	1-3
		240	50/60	0-280	3.0	.84	CCW	4-5	3-4
		240	50/60	0-240	3.0	.72	CW	1-4	1-3
		240	50/60	0-240	3.0	.72	CCW	1-4	3-4
		120	50/60	0-280	Fig. 8	....	CW	1-6	1-3
		120	50/60	0-280	Fig. 8	....	CCW	4-7	3-4

CHART No. 2

Single Phase Connection (Series)

Type	Mounting Style	Input Volts	Frequency	Output Volts	Max. Output Amps.	Max. KVA	Rotation	Jumper Terms	Input Terms	Output Terms
116-2S	Bench	240	50/60	0-280	7.5	2.1	CW	2-2	1-1	3-3
		240	50/60	0-280	7.5	2.1	CCW	5-5	4-4	3-3
		240	50/60	0-240	7.5	1.8	CW	1-1	4-4	3-3
		240	50/60	0-240	7.5	1.8	CCW	1-1	4-4	3-3
116U-2S	Panel	240	50/60	0-280	7.5	2.1	CW	5-5	4-4	3-3
		240	50/60	0-280	7.5	2.1	CCW	2-2	1-1	3-3
		240	50/60	0-240	7.5	1.8	CW	1-1	4-4	3-3
		240	50/60	0-240	7.5	1.8	CCW	1-1	4-4	3-3
216-2S	Bench	480	50/60	0-560	3.0	1.7	CW	2-2	1-1	3-3
		480	50/60	0-560	3.0	1.7	CCW	5-5	4-4	3-3
		480	50/60	0-480	3.0	1.4	CW	4-4	1-1	3-3
		480	50/60	0-480	3.0	1.4	CCW	1-1	4-4	3-3
		240	50/60	0-560	Fig. 8	....	CW	6-6	1-1	3-3
		240	50/60	0-560	Fig. 8	....	CCW	7-7	4-4	3-3
216U-2S	Panel	480	50/60	0-560	3.0	1.7	CW	5-5	4-4	3-3
		480	50/60	0-560	3.0	1.7	CCW	2-2	1-1	3-3
		480	50/60	0-480	3.0	1.4	CW	1-1	4-4	3-3
		480	50/60	0-480	3.0	1.4	CCW	4-4	1-1	3-3
		240	50/60	0-560	Fig. 8	....	CW	7-7	4-4	3-3
		240	50/60	0-560	Fig. 8	....	CCW	6-6	1-1	3-3

CHART No. 3

Three Phase Connection (Open Delta)

Type	Mounting Style	Input Volts	Frequency	Output Volts	Max. Output Amps.	Max. KVA	Rotation	Input Terms	Jumper Terms	Output Terms
116-2D	Bench	120	50/60	0-140	7.5	1.8	CW	1-2-2	1-1	1-3-3
		120	50/60	0-140	7.5	1.8	CCW	4-5-5	4-4	3-3-4
		120	50/60	0-120	7.5	1.6	CW	1-4-4	1-1	1-3-3
		120	50/60	0-120	7.5	1.6	CCW	1-1-4	4-4	3-3-4
116U-2D	Panel	120	50/60	0-140	7.5	1.8	CW	4-5-5	4-4	3-3-4
		120	50/60	0-140	7.5	1.8	CCW	1-2-2	1-1	1-3-3
		120	50/60	0-120	7.5	1.6	CW	1-1-4	4-4	3-3-4
		120	50/60	0-120	7.5	1.6	CCW	1-4-4	1-1	1-3-3
216-2D	Bench	240	50/60	0-280	3.0	1.5	CW	1-2-2	1-1	1-3-3
		240	50/60	0-280	3.0	1.5	CCW	4-5-5	4-4	3-3-4
		240	50/60	0-240	3.0	1.2	CW	1-4-4	1-1	1-3-3
		240	50/60	0-240	3.0	1.2	CCW	1-1-4	4-4	3-3-4
		120	50/60	0-280	Fig. 8	....	CW	1-6-6	1-1	1-3-3
		120	50/60	0-280	Fig. 8	....	CCW	4-7-7	4-4	3-3-4
216U-2D	Panel	240	50/60	0-280	3.0	1.5	CW	4-5-5	4-4	3-3-4
		240	50/60	0-280	3.0	1.5	CCW	1-2-2	1-1	1-3-3
		240	50/60	0-240	3.0	1.2	CW	1-1-4	4-4	3-3-4
		240	50/60	0-240	3.0	1.2	CCW	1-4-4	1-1	1-3-3
		120	50/60	0-280	Fig. 8	....	CW	4-7-7	4-4	3-3-4
		120	50/60	0-280	Fig. 8	....	CCW	1-6-6	1-1	1-3-3

CHART No. 4

Three Phase Connection (Wye)

Type	Mounting Style	Input Volts	Frequency	Output Volts	Max. Output Amps.	Max. KVA	Rotation	Input Terms	Jumper Terms	Output Terms
116-3Y	Bench	240	60	0-280	7.5	3.6	CW	2-2-2	1-1-1	3-3-3
		240	60	0-280	7.5	3.6	CCW	5-5-5	4-4-4	3-3-3
		240	50/60	0-240	7.5	3.1	CW	4-4-4	1-1-1	3-3-3
		240	50/60	0-240	7.5	3.1	CCW	1-1-1	4-4-4	3-3-3
116U-3Y	Panel	240	60	0-280	7.5	3.6	CW	5-5-5	4-4-4	3-3-3
		240	60	0-280	7.5	3.6	CCW	2-2-2	1-1-1	3-3-3
		240	50/60	0-240	7.5	3.1	CW	1-1-1	4-4-4	3-3-3
		240	50/60	0-240	7.5	3.1	CCW	4-4-4	1-1-1	3-3-3
216-3Y	Bench	480	60	0-560	3.0	2.9	CW	2-2-2	1-1-1	3-3-3
		480	60	0-560	3.0	2.9	CCW	5-5-5	4-4-4	3-3-3
		480	50/60	0-480	3.0	2.5	CW	4-4-4	1-1-1	3-3-3
		480	50/60	0-480	3.0	2.5	CCW	1-1-1	4-4-4	3-3-3
		240	60	0-560	Fig. 8	....	CW	6-6-6	1-1-1	3-3-3
		240	60	0-560	Fig. 8	....	CCW	7-7-7	4-4-4	3-3-3
216U-3Y	Panel	480	60	0-560	3.0	2.9	CW	5-5-5	4-4-4	3-3-3
		480	60	0-560	3.0	2.9	CCW	2-2-2	1-1-1	3-3-3
		480	50/60	0-480	3.0	2.5	CW	1-1-1	4-4-4	3-3-3
		480	50/60	0-480	3.0	2.5	CCW	4-4-4	1-1-1	3-3-3
		240	60	0-560	Fig. 8	....	CW	7-7-7	4-4-4	3-3-3
		240	60	0-560	Fig. 8	....	CCW	6-6-6	1-1-1	3-3-3

CONNECTION DIAGRAMS FOR 1 KVA FRAME SIZE POWERSTATS

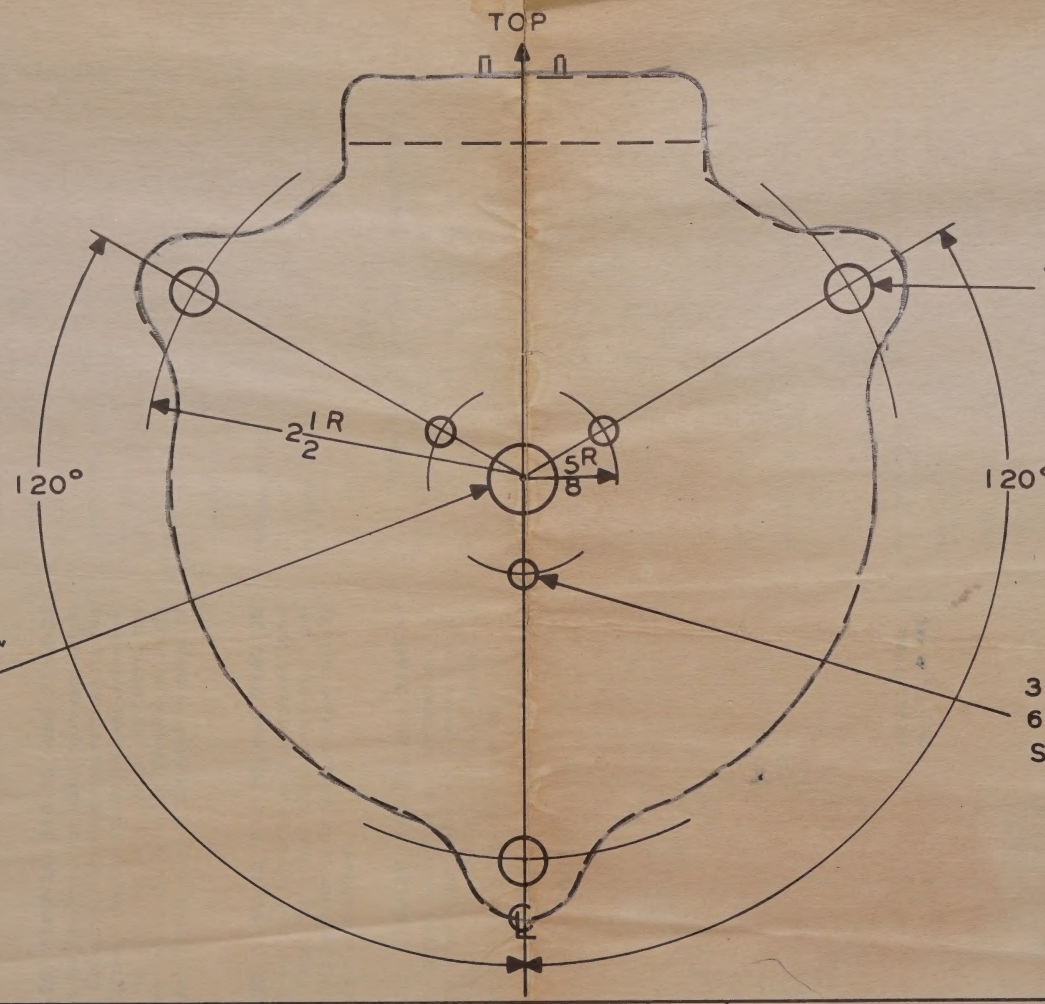
THE SUPERIOR ELECTRIC CO.
BRISTOL, CONN.

DATE - 3-2-50 DR. - AMM CH. - A.E.S.

DRAWING NO. SK7581

SE 5557

No. SK 5332



DIMENSION TOLERANCES	NO.	CHANGE	BY	DATE
Fractional ±	1	UNIT OUTLINE ADDED	LGH	4/9/65
Decimal ±				
UNLESS OTHERWISE SPECIFIED				
Scale: 1"=1"				

PANEL DRILLING TEMPLATE—116U & 216U

SUPERIOR ELECTRIC CO.

BRISTOL, CONN.

Date 11-26-46 Dr. AFG Ch.

DRAWING No. SK 5332

CONNECTIONS AND RATINGS

GANGED ASSEMBLIES

POWERSTATS are tandem mounted to obtain increased ratings and to permit three phase operation. Described below are series connected single phase; open-delta and wye connected three phase assemblies. The units are jumpered at the factory so that increasing output voltage is obtained with clockwise rotation.

TYPES 116-2S, 116U-2S, 216-2S, and 216U-2S

These units are employed for series connected single phase service. Chart No. 2 shows the connections for this duty. It must be noted that these units are inter-connected. Be sure that the units are jumpered to the correct terminals on each unit in the assembly. Neutral on single phase, three wire service may be connected to jumpered terminals.

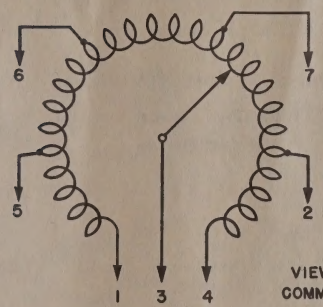
TYPES 116-2D, 116U-2D, 216-2D, and 216U-2D

These units are used for open-delta connected three phase service. Chart No. 3 shows the connections to employ. The jumpering between the units must be carefully followed for correct operation.

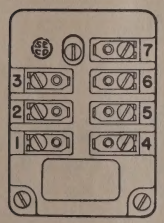
TYPES 116-3Y, 116U-3Y, 216-3Y, and 216U-3Y

These three ganged assemblies are operated on wye connected three phase lines. Chart No. 4 shows the connection arrangements. If a neutral line is to be used, it must be connected to the jumpered terminals.

FIGURE 2



VIEWED FROM COMMUTATOR END



TERMINAL ARRANGEMENT OF POWERSTATS TYPES 116 AND 216

NOTE– TERMINALS 6 AND 7 ARE NOT FURNISHED ON 116 TYPES

CHART No. 2

Single Phase Connection (Series)

Type	Mounting Style	Input Volts	Frequency	Output Volts	Max. Output Amps.	Max. KVA	Rotation	Input Terms	Jumper Terms	Output Terms
116-2S	Bench	240	50/60	0-280	7.5	2.1	CW	2-2	1-1	3-3
		240	50/60	0-280	7.5	2.1	CCW	5-5	4-4	3-3
		240	50/60	0-240	7.5	1.8	CW	4-4	1-1	3-3
		240	50/60	0-240	7.5	1.8	CCW	1-1	4-4	3-3
116U-2S	Panel	240	50/60	0-280	7.5	2.1	CW	5-5	4-4	3-3
		240	50/60	0-280	7.5	2.1	CCW	2-2	1-1	3-3
		240	50/60	0-240	7.5	1.8	CW	1-1	4-4	3-3
		240	50/60	0-240	7.5	1.8	CCW	4-4	1-1	3-3
216-2S	Bench	480	50/60	0-560	3.0	1.7	CW	2-2	1-1	3-3
		480	50/60	0-560	3.0	1.7	CCW	5-5	4-4	3-3
		480	50/60	0-480	3.0	1.4	CW	4-4	1-1	3-3
		480	50/60	0-480	3.0	1.4	CCW	1-1	4-4	3-3
		240	50/60	0-560	Fig. 1	.....	CW	6-6	1-1	3-3
		240	50/60	0-560	Fig. 1	.....	CCW	7-7	4-4	3-3
216U-2S	Panel	480	50/60	0-560	3.0	1.7	CW	5-5	4-4	3-3
		480	50/60	0-560	3.0	1.7	CCW	2-2	1-1	3-3
		480	50/60	0-480	3.0	1.4	CW	1-1	4-4	3-3
		480	50/60	0-480	3.0	1.4	CCW	4-4	1-1	3-3
		240	50/60	0-560	Fig. 1	.....	CW	7-7	4-4	3-3
		240	50/60	0-560	Fig. 1	.....	CCW	6-6	1-1	3-3

CHART No. 3

Three Phase Connection (Open Delta)

Type	Mounting Style	Input Volts	Frequency	Output Volts	Max. Output Amps.	Max. KVA	Rotation	Input Terms	Jumper Terms	Output Terms
116-2D	Bench	120	50/60	0-140	7.5	1.8	CW	1-2-2	1-1	1-3-3
		120	50/60	0-140	7.5	1.8	CCW	4-5-5	4-4	3-3-4
		120	50/60	0-120	7.5	1.6	CW	1-4-4	1-1	1-3-3
		120	50/60	0-120	7.5	1.6	CCW	1-1-4	4-4	3-3-4
116U-2D	Panel	120	50/60	0-140	7.5	1.8	CW	4-5-5	4-4	3-3-4
		120	50/60	0-140	7.5	1.8	CCW	1-2-2	1-1	1-3-3
		120	50/60	0-120	7.5	1.6	CW	1-1-4	4-4	3-3-4
		120	50/60	0-120	7.5	1.6	CCW	1-4-4	1-1	1-3-3
216-2D	Bench	240	50/60	0-280	3.0	1.5	CW	1-2-2	1-1	1-3-3
		240	50/60	0-280	3.0	1.5	CCW	4-5-5	4-4	3-3-4
		240	50/60	0-240	3.0	1.2	CW	1-4-4	1-1	1-3-3
		240	50/60	0-240	3.0	1.2	CCW	1-1-4	4-4	3-3-4
		120	50/60	0-280	Fig. 1	.....	CW	1-6-6	1-1	1-3-3
		120	50/60	0-280	Fig. 1	.....	CCW	4-7-7	4-4	3-3-4
216U-2D	Panel	240	50/60	0-280	3.0	1.5	CW	4-5-5	4-4	3-3-4
		240	50/60	0-280	3.0	1.5	CCW	1-2-2	1-1	1-3-3
		240	50/60	0-240	3.0	1.2	CW	1-1-4	4-4	3-3-4
		240	50/60	0-240	3.0	1.2	CCW	1-4-4	1-1	1-3-3
		120	50/60	0-280	Fig. 1	.....	CW	4-7-7	4-4	3-3-4
		120	50/60	0-280	Fig. 1	.....	CCW	1-6-6	1-1	1-3-3

CHART No. 4

Three Phase Connection (Wye)

Type	Mounting Style	Input Volts	Frequency	Output Volts	Max. Output Amps.	Max. KVA	Rotation	Input Terms	Jumper Terms	Output Terms
116-3Y	Bench	240	60	0-280	7.5	3.6	CW	2-2-2	1-1-1	3-3-3
		240	60	0-280	7.5	3.6	CCW	5-5-5	4-4-4	3-3-3
		240	50/60	0-240	7.5	3.1	CW	4-4-4	1-1-1	3-3-3
		240	50/60	0-240	7.5	3.1	CCW	1-1-1	4-4-4	3-3-3
116U-3Y	Panel	240	60	0-280	7.5	3.6	CW	5-5-5	4-4-4	3-3-3
		240	60	0-280	7.5	3.6	CCW	2-2-2	1-1-1	3-3-3
		240	50/60	0-240	7.5	3.1	CW	1-1-1	4-4-4	3-3-3
		240	50/60	2-240	7.5	3.1	CCW	4-4-4	1-1-1	3-3-3
216-3Y	Bench	480	60	0-560	3.0	2.9	CW	2-2-2	1-1-1	3-3-3
		480	60	0-560	3.0	2.9	CCW	5-5-5	4-4-4	3-3-3
		480	50/60	0-480	3.0	2.5	CW	4-4-4	1-1-1	3-3-3
		480	50/60	0-480	3.0	2.5	CCW	1-1-1	4-4-4	3-3-3
		240	60	0-560	Fig. 1	.....	CW	6-6-6	1-1-1	3-3-3
		240	60	0-560	Fig. 1	.....	CCW	7-7-7	4-4-4	3-3-3
216U-3Y	Panel	480	60	0-560	3.0	2.9	CW	5-5-5	4-4-4	3-3-3
		480	60	0-560	3.0	2.9	CCW	2-2-2	1-1-1	3-3-3
		480	50/60	0-480	3.0	2.5	CW	1-1-1	4-4-4	3-3-3
		480	50/60	0-480	3.0	2.5	CCW	4-4-4	1-1-1	3-3-3
		240	60	0-560	Fig. 1	.....	CW	7-7-7	4-4-4	3-3-3
		240	60	0-560	Fig. 1	.....	CCW	6-6-6	1-1-1	3-3-3

PRECAUTIONS

A POWERSTAT variable transformer is essentially a continuously tapped auto-transformer; therefore, be absolutely certain that the line voltage, phase, and frequency are as noted in the charts for each type of service.

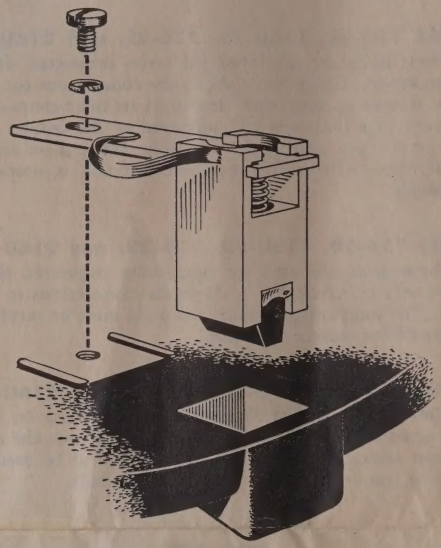
When POWERSTATS are not provided with fuses as an integral part of the unit, a fuse should be incorporated in the output brush lead. Fuses are considerably cheaper to replace than a POWERSTAT variable transformer.

The rotor should not be slammed against the stop. Such a practice tends to damage and weaken the entire POWERSTAT structure.

MAINTENANCE

A greatly improved brush assembly is now supplied on all models of POWERSTAT variable transformers types 116 and 216. This new design assures perfect contact of the brush to the commutator regardless of the brush position and the length of time in use. This means lower contact drop, reduction of heating and exceptionally long life.

When the brush contact in your POWERSTAT shows excessive wear, a new brush assembly can be purchased from the factory. The brush contact is made of special material and ordinary carbon will not function. Installation of a new brush assembly is extremely simple. First remove the worn brush assembly by unfastening the anchor screw. Discard this assembly. It is of no value. Place the new brush assembly in position. Insert the fastening screw with the lockwasher in position as shown in the drawing. Tighten the screw to the radiator. The brush pressure against the commutator surface is automatically assured by the new brush assembly design. To obtain the best possible fit it is recommended that the brush be sanded before use. Gently sand in the brush by holding a piece of fine crocus cloth, abrasive side up, between the brush and commutator, then rotate the radiator assembly a few times. Remove the crocus cloth and the POWERSTAT is again ready for service.



As a word of caution, make sure that the brush assembly is the right unit for your particular POWERSTAT.

The replacement brush assembly type numbers to use with the POWERSTAT are shown below.

POWERSTAT TYPE	BRUSH ASSEMBLY NUMBER
116 (all models)	BP8740 Group 5
216 (all models)	BP8740 Group 6

Whenever trouble arises regarding mechanical or electrical difficulties in the operation of your POWERSTAT variable transformer, write to the factory at Bristol, Connecticut.

THE SUPERIOR ELECTRIC COMPANY

BRISTOL, CONNECTICUT, U. S. A.